REMARKS

Claims 1-32, 34-87 and 89-112 are pending in the present application. Claims 1, 4, 5, 7-11, 13, 14, 16, 18, 19, 21-26, 41, 48-53, 55, 56, 59, 60, 62-66, 68, 69, 71, 73, 74, 76-81, 85, 96, 103-107 and 110-112 are amended above. No new matter is added by the claim amendments. Entry is respectfully requested.

Claims 1, 2, 4-11, 13, 14, 16-19, 21-28, 30, 32-36, 40-46, 56, 57, 59-66, 68, 69, 71-74, 76-83, 85, 87-91, 95-101, 111 and 112 are rejected under 35 U.S.C. 102(e) as being anticipated by Carson (U.S. Patent No. 6,477,124). Claims 3, 29, 58 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson. Claims 12, 15, 20, 47, 67, 70, 75 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Kamoto, *et al.* (U.S. Patent No. 5,708,649 - hereinafter "Kamoto"). Claims 31 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Watanabe, *et al.* (U.S. Patent No. 6,775,227 - hereinafter "Watanabe"). Claims 37-39 and 92-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Dubois, *et al.* (U.S. Publication No. 2002/0142248). Claims 48-55 and 103-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Imai, *et al.* (U.S. Patent No. 5,799,145 - hereinafter "Imai"). Reconsideration and removal of the rejections are respectfully requested.

The present invention as claimed in independent claim 1 is directed to a method for authenticating a digital medium. A read operation of data symbols from a media reading device is requested at a computing device. A transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, is monitored. The read user data is in a format that can be processed by the computing device. The transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation. The presence of an anomaly region on the digital medium

corresponding to the physical location of the data symbols on the digital medium is determined, at the computing device, from the monitored transfer rate, by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device. The digital medium is authenticated based on a characteristic of the anomaly region.

The present invention as claimed in independent claim 56 is directed to a system for authenticating a digital medium. A computing device requests a read operation of data symbols from a media reading device. A monitor monitors a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium. The read user data is in a format that can be processed by the computing device. The transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation. The computing device further includes an anomaly detector that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device. An authenticator authenticates the digital medium based on a characteristic of the anomaly region.

A synopsis of Carson's teachings was provided in Applicants' Amendment A, filed in the present application on March 7, 2006, and is repeated below for the convenience of the Examiner:

> Carson is directed to a system and method for controlling access to an optical disc, based on the frequency at which data is recorded on the disc. Carson relies on a deliberate change in the effective lengths of pits and lands that specifically affect the operation of the drive to require the drive to reduce or increase its rotational velocity. This operation by the drive is in response to what would otherwise appear to be slow data frequency or fast data frequency, relative to the nominal data frequency of the remainder of the disc. Thus, the "data rate" that Carson refers to is the rate at which data symbols in the form of pits and lands

> are presented to the readback head assembly, as a result of deliberate variations in the angular velocity of the disc when the data are recorded on the disc or the master that is used to stamp the disc, and as a result of the readback system's reaction to such variations. When a readback system determines that the current angular velocity of the disc is insufficient for the present data being read, the readback system loses "frequency lock" and automatically makes an adjustment in the angular velocity in an effort to recapture frequency lock. In Carson, the data rate of the recorded data is deliberately varied, so that when a readback operation of the data takes place, the readback system is forced to respond to the variation in the data rate by varying the angular velocity of the readback system in order to maintain frequency lock during readback. The Carson approach analyzes the variations in the angular velocity during readback, and makes decisions regarding user access to the data stored on the disc based on the analysis. (Amendment A dated March 7, 2005, page 25, paragraph 1).

To further clarify, the Carson approach is premised on varying the frequency at which data symbols in the form of pits and lands are recorded on a disk. Carson refers to this frequency as "data rate" of the data symbols, and variation of such data rate translates to the relative lengthening or shortening of the data symbols on the recorded medium. In different disclosed embodiments of Carson, variation of the lengths of the data symbols can be abrupt (as in the embodiments of FIGs. 4 and 5), or gradual (as in the embodiments of FIGs. 6 and 7).

A data symbol recording operation of Carson is explained in connection with FIGs. 4 and 8, and with reference to column 7, lines 1-26 and column 8, line 44 - column 9, line 13. In nominal regions of the disk, represented by regions 176, 178, 180, 182, the data symbols are of lengths that correspond with the nominal data rate of the disk. In velocity disruption zones of the disk, represented by regions 184, 186, 188, the recorded data symbols are relatively, and abruptly, shorter or longer in length than the data symbols of the nominal regions 176, 178, 180, 182.

When a disk characterized by FIGs. 4 and 5 is read in Carson, as explained in connection with FIGs. 5 and 9, and with reference to column 7, lines 27-57 and column 9, lines 15-67, the

object is for the readback system 140 to maintain lock of the data symbols during reading so that their data rate, that is, the rate at which the data symbols are presented to the read-back head 144, is maintained at a constant level. As a result, the data symbols on the disk 142 can be interpreted and converted to user data by the bit detector 146 and the decoder 152, that can be output by the main channel processor 154 to a computer system as output data OUTPUT DATA 158. A gradual adjustment in angular disk velocity, or rotational velocity, maintains the constant linear velocity of the data symbols presented to the read-back head 144 and thus the "data rate" during readback is maintained at a constant level during reading of the nominal regions. When "velocity disruption zones" 204, 206, 208 are encountered, the data symbols of the disk 142 in those zones are not initially interpretable, and therefore, the rotational velocity of the disk must be increased or decreased in those zones in order to achieve "lock" on the data symbols in those zones. By increasing or decreasing the rotational velocity of the disk while reading the data symbols in the velocity disruption zones, lock of the reading operation of the data symbols can be achieved, because the "data rate" of the data symbols in each respective velocity disruption zone is made to be at the same level as the data rate of the data symbols in the nominal zones through the increase or decrease in angular velocity. Thus, Carson teaches maintenance of a constant "data rate" during readback of the data symbols in both the nominal zones and the velocity disruption zones.

The same holds true for a read operation of a disk characterized by FIGs. 6 and 7 of Carson. In this embodiment, however, the velocity disruption zones 228 correspond to a gradual variation in the "data rate" of the data symbols. Thus, lock of the reading operation requires a more gradual variation of the disk rotational velocity. Such adjustment to achieve lock in this "gradual" embodiment of Carson results in the maintenance of a constant "data rate" during readback of the data symbols in both the nominal zones and in the velocity disruption zones, as in the "abrupt" embodiment of Carson.

The changes in the rotational velocity of the disk during readback are monitored in Carson to determine whether an unauthorized duplication of the disk has occurred. For example, an abrupt or gradual change in velocity during readback can be indicative of the presence of a velocity disruption zone on the disk. The positions of such zones on the disk and the magnitude of the relative change in velocity at these positions are compared to expected positions/magnitudes to make a determination as to authenticity of the disk (see Carson, page 8, lines 15-39).

The analysis performed under Carson's teachings thus exclusively relates to that of the "data rate" during readback of data symbols as they are recorded on the disk. This is accomplished through the relative lengthening and shortening of data symbols on the disk, which, when encountered during readback, requires the readback system to increase or decrease the rotational speed of the disk, so that lock can be maintained, resulting in a constant rate of read data symbols during readback.

The Office Action indicates at paragraph 6 that the Office is unpersuaded by Applicant's arguments in the Amendment filed March 9, 2006. In particular, the Office Action indicates at paragraphs 7 and 8 that the Office disagrees with Applicant's earlier assertion that Carson fails to teach or suggest "monitoring a transfer rate of read data from the media device to the computing device ..." In support of this position, a statement from Sasake (U.S. 6,958,960) is cited in the Office Action. With regard to Sasake, although, under certain conditions, the data read transfer rate of a system may be related to the rotational velocity of the information medium, and under some circumstances, a higher rotational velocity would increase the read rate of the data, and a lower rotational velocity would decrease the read rate of the data, this is not what Carson is teaching. Instead, in Carson, when a velocity disruption zone is encountered, the rotational velocity of the disk is increased or decreased in response to the relative lengthening or shortening of the recorded data symbols. However, even considering the increased or decreased rotational velocity as a result of encountering a velocity disruption zone, the data symbols in Carson are

still presented to the readback head at the nominal data rate. The increase or decrease in rotational velocity accomplishes this, and doing so allows the readback system to achieve lock, and the data rate remains constant and substantially the same, in both the nominal zones and the velocity disruption zones.

In addition, the Office Action indicates at paragraphs 9 and 10 that the Office disagrees with Applicant's earlier assertion that Carson fails to teach or suggest "determining at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium ... by identifying a modification in the transfer rate of the read data from the media device to the computing device ..." In support of this position, text from column 9, lines 40-67 of Carson is cited in the Office Action, and a statement is made in the Office Action that this amounts to a disclosure by Carson of "comparing the actual data rate with the expected data rate characteristics and detecting a velocity disruption zone." While Carson discloses at column 9, lines 40-67, comparing actual "data rate" with expected "data rate" characteristics, and thereby detecting the presence of a velocity disruption zone, the "data rate" examined in Carson is with respect to the "rate" at which data symbols are recorded on the disk, and not a rate at which the output data OUTPUT DATA (see FIG. 3) of Carson are transferred to the computing system. As explained above, the rate of transfer of the output data OUTPUT DATA of Carson is independent of the "data rate" of the Carson data symbols. In Carson, the objective is to increase or decrease the rotational velocity of the disk in response to decreased or increased "data rate" for the data symbols recorded on the disk, so that the read back operation of the data symbols can be maintained at a constant level, allowing lock to be achieved. This would result in a substantially constant transfer rate of output of the output data OUTPUT DATA in Carson.

In consideration of the above, claims 1 and 56 are amended above to further clarify that the data that are recorded on the digital medium are "data symbols". Such pre-processed "data symbols" are to be distinguished from the post-processed "user data" which relate to the format in which data are transferred from the media reading device to the computing device. The "data

symbols" as recorded on the digital medium are in the form of associated structures; for example in the form of pits and lands in the case where the digital medium is an optical medium. The "user data" can take the form of data "in a format that can be processed by the computing device", such as bits or collections of bits of binary or digital data as claimed in amended claims 1 and 56. In addition, claims 1 and 56 are further amended to state that the "user data" are transferred from "an output of" the media reading device to the computing device.

Carson fails to teach or suggest the present invention as claimed in independent claims 1 and 56. In particular, Carson fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", as claimed in claim 1. Carson further fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", as claimed in claim 56.

Carson does not teach or suggest the monitoring of (claim 1) or a monitor that monitors (claim 56) "a transfer rate of read user data ..." the read user data being "in a format that can be processed by the computing device." Carson instead teaches the monitoring of what is referred to in Carson as a "data rate" of the data symbols on the disk; namely, the rate at which the data symbols are presented to the readback head. The data symbols in Carson are not "read user data"

that are "in a format that can be processed by the computing device...", as claimed in claims 1 and 56. Instead, the Carson data symbols that are monitored are pre-processed structures on the disk that are not yet converted to such a format.

In addition, Carson does not teach or suggest the monitoring of (claim 1) or a monitor that monitors (claim 56) "a transfer rate of read user data from an output of the media reading device...", as claimed. Carson does not teach or suggest monitoring of the rate at which the data output from the readback system 140, namely output data OUTPUT DATA 158, are transferred. Carson instead teaches monitoring the "data rate" of the data symbols on the disk 142, as described above, which monitoring is made in connection with the internal operation of the readback system 140 by monitoring changes in the rotational velocity of the disk during readback. As explained above, the monitored "data rate" of the "data symbols" in Carson is not related to the rate of transfer of the Carson output data OUTPUT DATA 158. In any event, Carson discusses the concept of "data rate" merely in connection with maintaining the data rate at a constant level when reading both the nominal zones and the velocity disruption zones of the disk by making adjustments in disk rotational velocity.

Further, Carson fails to teach or suggest "determining, at the computing device ..." (claim 1) or "an anomaly detector at the computing device that determines ..." (claim 56), from the "monitored transfer rate, the presence of an anomaly region on the digital medium ... by identifying a modification in the transfer rate of the read user data." Carson does not discuss monitoring of the transfer rate of the output data OUTPUT DATA 156 output by the readback system 140. Further, what is monitored in Carson, namely variations in the data rate of the data symbols on the disk, is not "read user data" in a format that can be processed by a computing device, as claimed in claims 1 and 56, as described above.

Amended independent claims 1 and 56 are therefore believed to be in condition for allowance, and such allowance is respectfully requested. With regard to the rejection of

dependent claims 2, 3, 4-11, 13, 14, 16-19, 21-28, 29, 30, 32-36, 40-46, 57-66, 68, 69, 71-74, 76-83, 84, 85, 87-91, 95-101, 111 and 112, it is submitted that these claims should inherit the allowability of independent claims 1 and 56 from which they depend.

With regard to the rejection of claims 12, 15, 20, 47, 67, 70, 75, and 102 in view of the combination of Carson and Kamoto, it is submitted that, like Carson, Kamoto fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Kamoto fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device", as claimed in claim 56. Since neither Carson nor Kamoto teach or suggest the stated limitations, there is no combination of the references that

would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claims 12, 15, 20, and 47, as may be applied to amended independent claim 1, and reconsideration and removal of the rejection of claims 67, 70, 75, and 102, as may be applied to amended independent claim 56, and allowance of such claims, are respectfully requested.

With regard to the rejection of claims 31 and 86 in view of the combination of Carson and Watanabe, it is submitted that, like Carson, Watanabe fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Watanabe fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device", as claimed in claim 56. Since neither Carson nor

Watanabe teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claim 31, as may be applied to amended independent claim 1, and reconsideration and removal of the rejection of claim 86, as may be applied to amended independent claim 56, and allowance of such claims, are respectfully requested.

With regard to the rejection of claims 37-39 and 92-94 in view of the combination of Carson and Dubois, it is submitted that, like Carson, Dubois fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Dubois fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from

the media reading device to the computing device", as claimed in claim 56. Since neither Carson nor Dubois teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claims 37-39, as may be applied to amended independent claim 1, and reconsideration and removal of the rejection of claims 92-94, as may be applied to amended independent claim 56, and allowance of such claims, are respectfully requested.

With regard to the rejection of claims 48-55 and 103-110 in view of the combination of Carson and Imai, it is submitted that, like Carson, Imai fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Imai fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital

medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device", as claimed in claim 56. Since neither Carson nor Imai teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claims 48-55, as may be applied to amended independent claim 1, and reconsideration and removal of the rejection of claims 103-110, as may be applied to amended independent claim 56, and allowance of such claims, are respectfully requested.

Closing Remarks

It is submitted that all pending claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

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